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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

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TITLE

FOREST INSECT SURVEY - SEASON OF 1943

LASSEN VOLCANIC NATIONAL PARK, CALIFORNIA

by

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April 8, 1944

SUBJECT—

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U. S. Department of Agriculture
Bureau of Entomology and Plant Quarantine
Forest Insect Investigations

FOREST INSECT SURVEY - SEASON OF 1943

LASSEN VOLCANIC NATIONAL PARK, CALIFORNIA

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April 8, 1944

ABSTRACT OF RESULTS

A. The 1942 Infestation (complete record)

1. Total timber (all species) killed on reporting areas (Table 4)

   a. Number of trees 1,459
   b. Volume ?
   c. Average number of trees per section 11

2. Present classification - low endemic

3. Primary insects - Western pine beetle in ponderosa pine
   Mountain pine beetle in sugar pine, lodgepole pine and white pine
   Jeffrey pine beetle in Jeffrey pine
   Fir engraver beetle and western fir borer in white and red fir.

4. Trend - slight decrease over 1941

5. Control work completed - none

B. The 1943 Infestation (partial record)

1. Total timber (all species) killed on reporting areas (Table 4)

   a. Number of trees 832
   b. Volume ?
   c. Average number of trees per section 6

2. Present classification - low endemic

3. Primary insects - same as in 1942

4. Trend - Probable slight increase over 1942

5. Control work completed - none

6. Control work recommended - maintenance control on high use areas and administrative sites.

INTRODUCTION

A survey of forest insect conditions in Lassen Volcanic National Park was made by John E. Patterson of the Forest Insect Laboratory, Bureau of Entomology and Plant Quarantine, Berkeley, California, during the period November 7 to 11, 1943.

Because of the lateness of the season, the Park had already been closed to visitors and unfortunately it was impractical to contact the park personnel which had moved out to headquarters at Mineral. Climatic conditions encountered emphasize the necessity for completing the annual surveys of this park before fall snows close the high country. It is recommended that future surveys be made not later than mid-September.

Deep snow in the high country prevented a complete survey of the park forests in the eastern lake section, and limitations in personnel and travel made the coverage of the park less detailed than desirable. Hence, the loss estimates are more sketchy than normally obtainable. However, it was possible to make a thorough reconnaissance of the areas most important, both in recreational value and in potential insect damage. Special attention was given to campground sites and administration centers. Measurement of the infestation on such areas was secured from roadside strips traversing the areas. These surveys yielded data that provided a reliable basis for estimating recent and current losses. On other areas traverse examinations combined with counts made from vantage points constituted the basis for the general estimates of recent losses.

REPORTING UNITS

This report deviates somewhat from previous methods of reporting insect conditions on this park, particularly with respect to reporting units. Heretofore, reporting of damage and losses has been largely based on administrative considerations; generally grouping infestations on campgrounds and on intensively used areas together as of first importance, and infestations on the little used areas as of secondary importance. Since infestations occur irrespective of administrative lines, it seems more logical to report them on an ecological basis. Hence, the park forests have been organized into reporting units comprising definite infestation and environmental characteristics. In defining these units, recourse to previous reports supplied much of the needed data. Additional information was secured in the 1943 survey.

We feel that the present organization provides a better system for reporting inclusive unit infestations, yet does not disregard administrative considerations in planning and conducting necessary local control work. The reporting units set up are listed and described in Table 1 and their location is shown on the base map accompanying this report.

Table 1. Reporting units - Lassen National Park

No.	Title	Timbered Area Sections	Timbered Area Acreage	Stand Composition
1	Manzanita Lake	4	2,560	PP-JP-LP-WF
2	Lost Creek	6	3,840	PP-JP-SP-WF
3	Badger	7	4,480	PP-JP-LP
4	Butte Lake	3	1,920	PP-JP-LP
5	Warner Valley	8	5,120	SP-JP-WF
		28	17,920	
6	Summit Lake	5	3,200	LP-WF-MH
7	Hat Mountain	13	8,320	LP-WF-RF-MH
8	Snag Lake	20	12,800	LP-WF-JP
9	Juniper Lake	20	12,800	LP-WF-RF
10	Pilot Mountain	6	3,840	LP-WF-RF-MH
11	White Mountain	12	7,630	WP-WF-RF-MH
12	Mill Creek	10	6,400	WP-WF-RF-MH
13	Loomis	12	7,680	WP-WF-RF-MH
		98	62,720	
	Totals	126	80,640	

RESULTS OF THE SURVEY

Character of Infestation

In general the infestations of 1942 and 1943 were characterized by a decrease in activity of all insect species inhabiting the park. The resultant losses in all tree species were generally maintained at low endemic status, although locally on some intensively used areas, particularly campground sites, losses were slightly above this level.

A light infestation of the Jeffrey pine beetle, Dendroctonus jeffreyi Hopk., was sustained in Jeffrey pine throughout the range of this species within the park. Trees attacked by the Jeffrey pine beetle were generally found to be infested also with the emarginate engraver Ips emarginatus Le. The loss in these stands during 1942 is estimated to average about 12 trees per section.

The scant stands of ponderosa pine and sugar pine sustained token infestations of the western pine beetle, Dendroctonus brevicomis Lec., and the mountain pine beetle, Dendroctonus monticolae Hopk., respectively.

The mountain pine beetle infestations persisted in the extensive lodgepole pine stands of the eastern section of the park, but on a scale much reduced from their former status. A few trees were killed on each of several campground areas, but generally the 1942 loss was the lowest yet recorded for this park. This same beetle was also active in white pine of the higher altitudes although damage in this species was very light.

Infestations of Scolytus spp. in Abies were prevalent throughout the alpine stands but damage was not heavy at any place. A very conspicuous condition resulting from dying terminals of lateral twigs was noted throughout the fir stands, but it was found to be due not to insects but to mistletoe. This same type of injury has been reported in former years by other observers. There was no damaging infestation in mountain hemlock. This species is highly immune to insect attack in this park.

Measured Plot Losses

Several of the reporting units are admirably adapted to roadside strip-type plots and traverse surveys so these methods were made use of to some extent in the 1943 survey. Tables 2 and 3 present the comparative loss data obtained from cruises of the four roadside plots surveyed.

Table 2. Measured Pine Losses on Roadside Strips.

Roadside Strip	Acreage	Tree Spp.	Loss in 1942 Trees	Volume	Vol/ac.	Loss in 1943 Trees	Volume	Vol./ac.
1 Lost Creek	116	JP	1	110	1 bf	2	770	7 bf
		PP	3	2,400	20 bf	1	760	7 bf
			4	2,510	21 bf	3	1,530	13 bf
2 Warner Valley	84	JP	3	2,280	27 bf	2	1,960	23 bf

Table 3. Measured Fir Losses on Roadside Strips.

Roadside Strip	Acreage	Tree Spp.	Loss in 1942 Trees	Volume	Vol/ac.	Loss in 1943 Trees	Volume	Vol./ac.
3 Mill Creek	80	RF	8	3,200	40 bf	5	2,500	30 bf
4 White Mtn.	104	RF	12	4,800	46 bf	8	3,500	33 bf

Estimated Unit Losses

Infestation conditions in the park forests are discussed independently under reporting units. The quantitative estimates given, as well as the infestation characteristics, are based largely on road traverse, reconnaissance counts and on strip counts wherever these were feasible. A summary of estimated losses on all the units is shown in Table 4.

Table 4. Summary of estimated timber losses by bark beetles in 1942 and 1943.

	Unit	Timbered acreage	Trees killed in 1942 (Complete record) Pine	Fir	Total	Trees killed in 1943 (Partial record) Pine	Fir	Total
1	Manzanita	2,560	16	8	24	11	6	17
2	Lost Creek	3,200	50	15	65	35	10	45
3	Badger	4,480	100		100	50		50
4	Butte Lake	2,240	80		80	60		60
5	Warner Valley	8,960	130	40	170	90	25	115
6	Summit Lake	3,200	20	20	40	5	20	25
7	Hat Mountain	8,320	was not surveyed in 1943					
8	Snag Lake	12,800	was not surveyed in 1943					
9	Juniper Lake	12,800	was not surveyed in 1943					
10	Pilot Mountain	3,840		80	80		60	60
11	White Mountain	7,680		600	600		300	300
12	Mill Creek	6,400		300	300		160	160
13	Loomis	7,680	was not surveyed in 1943					
	Totals	80,640	396	1,063	1,459	251	581	832

1 Manzanita Lake. This 2,560 acre area is situated in the NW corner of the park and includes all of the ponderosa pine and Jeffrey pine stands in this section. The timber is mature and overmature but not highly susceptible to beetle attack. Past insect losses have been only moderately damaging. During 1942 and 1943 a few Jeffrey pine trees east of the lake were killed by the Jeffrey pine beetle. A light infestation was present in white fir on the higher benches. The recent trend of infestations in this unit has been definitely downward.

2 Lost Creek. This is one of the few low altitude areas of the park and is situated along the north boundary between Noble Pass and Raker Peak. It contains 3,200 acres partially timbered. The type is primarily Jeffrey pine with a low percentage of ponderosa and sugar pine. The stands are overmature and moderately susceptible to beetle attack. Past losses have been rather severe, leaving many snags and down trees. During the past two years, losses have been endemic and the infestation trend slightly downward. The estimated loss for 1942 is 50 trees in all pine species. The 1943 loss is not expected to exceed this total. A roadside strip and extensive counts formed the basis for these estimates.

3 Badger. This unit includes the comparatively flat country lying between Raker Peak and Prospect Peak. It is about the same elevation as Lost Creek and the timber stands are comparable to that unit, though containing a somewhat greater content of lodgepole pine. Recent infestation conditions and trends were determined from road traverse and extensive viewing from West Prospect Peak. Losses in all species during the last biennium have been the lowest yet recorded for these stands. Past losses in lodgepole pine have been severe and many deadenings of moderate size are the result of former activity of the mountain pine beetle. The estimated loss in pine for 1942 is 60 Jeffrey and ponderosa pine trees and 40 lodgepole pine trees. The current infestation is endemic and static.

4 Butte Lake. This is another low altitude area lying north and east of Butte Lake. It is not extensive but contains a fine stand of pine and is one of the principal recreational areas where the Park Service maintains summer administration. The timber type is largely composed of ponderosa pine, Jeffrey pine and lodgepole pine. Trees are largely overmature. This condition, coupled with intensive recreational use during the summer months, renders the stands highly susceptible to bark beetle attack. Past losses have been high and have resulted in considerable stand depletion, especially in the more important campground stands. Current infestations are slightly less than formerly and may be considered normal for these stands. The 1942 loss in pine is estimated to average about 20 trees per section, or about 80 trees on the entire recreational area. There is no current infestation in lodgepole. This area should be closely watched for increased infestation.

5 Warner Valley. The unit includes the lower benches in the SE corner of the park. It is fairly heavily timbered with stands of Jeffrey pine and white fir, with a small amount of sugar pine. It is not an even-aged forest and contains trees in all class groups. The overmature trees are highly susceptible to insect attack as witnessed by the prevalence of snags. High normal infestations in both pine and fir have occurred in recent years, although the current loss is considerably less than formerly. Losses during 1942 are estimated to average 15 trees per section in Jeffrey pine and not to exceed 5 trees per section in fir. These estimates are based on roadside strip and counts of faded trees. The present infestation trend is toward reduced losses.

6 Summit Lake. This small lodgepole pine area consists of five sections located in Dersch Meadow and on the moraine above Hat Lake. It is one of the principal camping areas of the park and is subjected to intensive use during the park season. In past years the mountain pine beetle has been highly active in the lodgepole pine stands, killing trees in the usual group fashion. However, infestations are quiescent at present and losses are negligible. A total of 20 attacked trees was all that could be ascribed to the infestation of 1942.

7 Hat Mountain. This unit is one of the medium elevation areas of the park system, but because of the terrain and prevailing north slopes it is largely timbered with lodgepole pine and firs. Due to snow barriers it was not visited in 1943, but a distant view of the main slopes was obtained from Prospect Peak. No indications of damaging infestations were apparent from this distance.

8 Snag Lake and 9 Juniper Lake. These two units were not visited. Because of deep snow, which had closed the roads and trails, it was not possible to extend the survey into this high lake section of the park.

10 Pilot Mountain. This unit includes the high ridge between White Mountain and Crater Butte. The timber type is composed almost exclusively of white and red fir. Current infestations are of moderate intensity and losses may be considered normal for these stands.

11 White Mountain. The unit includes the alpine forests of white fir and red fir and mountain white pine on the east and south slopes of Lassen Peak. It is traversed throughout by the Loop road and is visible from many vantage points located along the road and from the high points above it. Red fir is the predominating species, although mountain pine is well represented in the stands. Past insect losses in both fir and pine have been severe and great openings in the stands have resulted from insect depredations. The current loss in fir is much reduced from former proportions. There is no current loss in white pine. Insect conditions were sampled on a roadside strip of approximately three miles in length through the eastern section of the unit. In addition counts of faded trees throughout the unit were obtained from many viewpoints. From these basic data it is estimated that the 1942 loss in fir amounted to 600 trees, or about 50 trees per section on the 12 sections included in the unit. Compared with the status of previous years, this amount shows a definite reduction.

12 Mill Creek. This unit includes the Mill Creek drainage basin south of Lassen Peak. The timber type is the same as that in White Mountain Unit, and the insect conditions, past and present, are approximately the same. The Loop highway traverses the unit and offers a convenient and adequate means of sampling infestations by the use of roadside strips. Roadside strip and extensive counts were the methods used in sampling the 1942 infestation. The loss for that year is estimated to total 300 trees, or about 30 trees average per section, and was mainly confined to red fir.

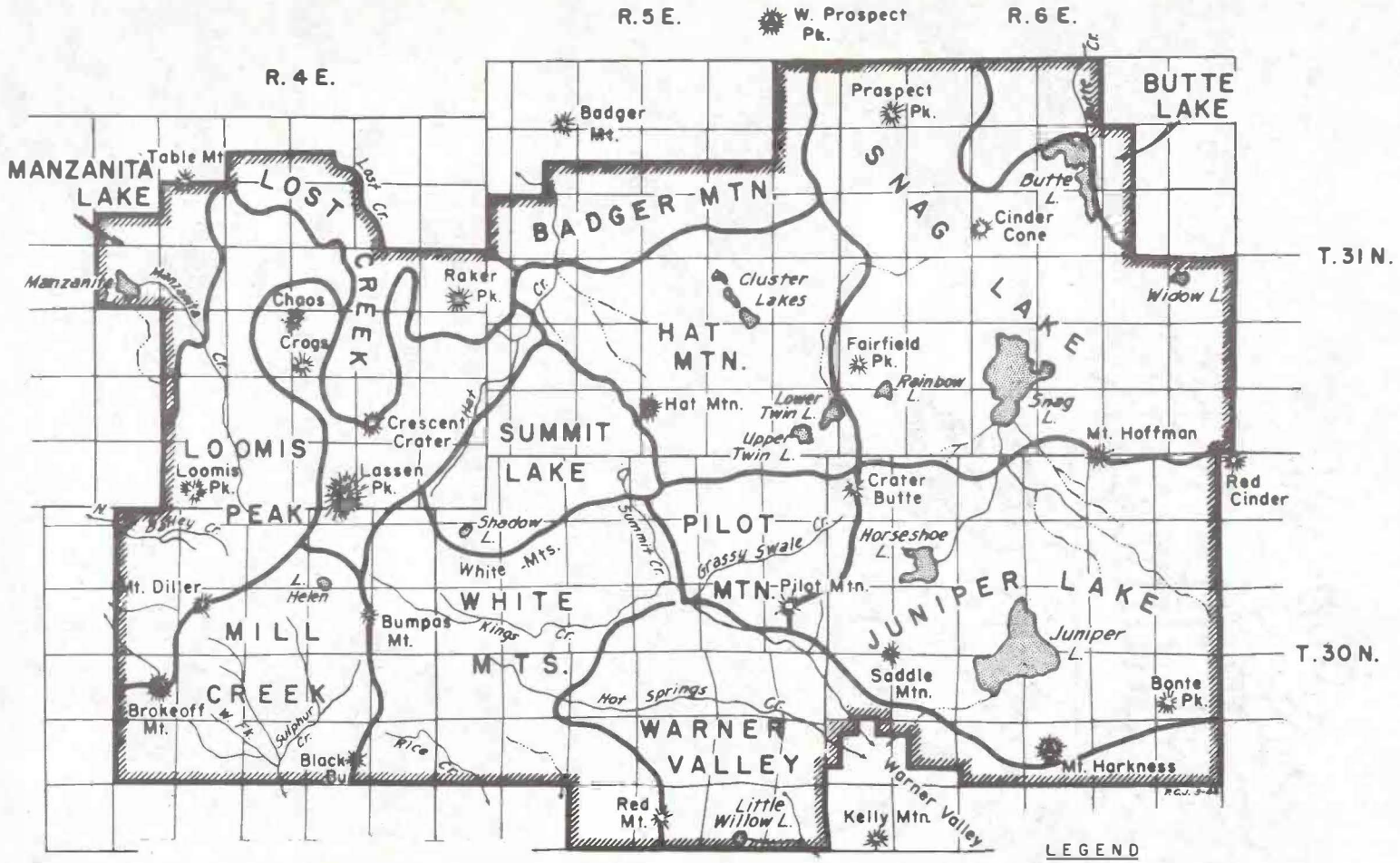
13 Loomis. This unit includes the high peak region west of the divide from Brokeoff Mountain through Lassen Peak to Chaos Crags. Timber stands are largely composed of white and red fir and mountain white pine. This unit was not visited during the 1943 survey.

RECOMMENDATIONS

Infestation conditions found generally throughout the park forests do not appear sufficiently serious to warrant any large scale control operations.

A small amount of maintenance control work is desirable on the high-use areas, even though the number of infested trees on each is small. This type of control is most urgent where Jeffrey pine and ponderosa pine constitute the principal stand species. Manzanita Lake, Lost Creek and Butte Lake areas are of first importance in any control work undertaken during the year 1944. Maintenance control could very well be extended through Summit Lake and Warner Valley areas if funds and manpower are available. However, these areas may be considered of secondary importance in current control plans.

Recurring infestations may be expected annually in pine on all areas of intensive use where abnormal conditions result from over-use of the area by park visitors. In order to cope with these conditions and prevent undue insect losses, maintenance control during each spring period should become an established part of the park's protection schedule.



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FOREST INSECT SURVEY

LASSEN VOLCANIC NATIONAL PARK
CALIFORNIA

SEASON OF 1943

SCALE MILES
0 1 2

LEGEND

CONIFEROUS STANDS
- Infestation Normal
- Light
- Moderate
- Heavy

BOUNDARY LINES
- Park Boundary
- Entomological Units

GROUND SAMPLES
- Plots
- Strips
- Observation Plots

7 copies typed; distribution as follows:

1 - FCC
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3 - Mack Park Service (1 - Coffman
1 - Park Supt.
1 - Reg. Forester)
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